Africa RISING phase II

Regional Proposal for the Ethiopian highlands

**Contents**

[1. Background and rationale 8](#_Toc450899438)

[1.1 Agriculture in Ethiopia 8](#_Toc450899439)

[1.2 Rationale 10](#_Toc450899440)

[2. Challenges and opportunities 11](#_Toc450899441)

[3. Achievements and lessons from phase I 12](#_Toc450899442)

[3.1 Achievements: 12](#_Toc450899443)

[3.1.1 Research and development highlights 12](#_Toc450899444)

[3.1.2 Communications and learning highlights 13](#_Toc450899445)

[3.1.3 Partnership highlights 14](#_Toc450899446)

[3.1.4 Lessons 15](#_Toc450899447)

[4. Operational approaches for phase II 17](#_Toc450899448)

[5. Implementation 18](#_Toc450899449)

[5.1 Research questions 18](#_Toc450899450)

[5.2 Research activities 18](#_Toc450899451)

[5.2.1 Generic 18](#_Toc450899452)

[5.2.2 Backstopping 19](#_Toc450899453)

[5.3 Example scaling partnerships 20](#_Toc450899454)

[5.3.1 Feed resources innovations—Scaling at farm and watershed level 20](#_Toc450899455)

[5.3.2 Scaling out of improved barley, food legumes and potato technologies for food security, income and feed in the central and northern highlands of Ethiopia 22](#_Toc450899456)

[5.3.3 Scaling niche-specific input delivery systems in the Ethiopian highlands 25](#_Toc450899457)

[5.3.4 Creating climate-smart multifunctional landscapes through restoration, ecological intensification and diversification at different scales 27](#_Toc450899458)

[5.4 Monitoring and evaluation arrangements 32](#_Toc450899459)

[5.5 Communications arrangements 32](#_Toc450899460)

[6. Relevance to cross-cutting issues 34](#_Toc450899461)

[7. Project management and coordination 36](#_Toc450899462)

[7.1 Project staff 36](#_Toc450899463)

[7.2 Project advisory group (PAG) 36](#_Toc450899464)

[7.3 Partner cross-learning and feedback forum (PCLFF) 36](#_Toc450899465)

[8. Implementation timeline 37](#_Toc450899466)

[9. Core CGIAR partners and contact points 38](#_Toc450899467)

[10. Budget 39](#_Toc450899468)

[11. CVs of key personnel 40](#_Toc450899469)

[12. References 43](#_Toc450899470)

**List of tables**

[Table 1. Population in major regions of Ethiopia 8](#_Toc450899409)

[Table 2. Major crops and 2014/2015 crop production. 9](#_Toc450899410)

[Table 3.Livestock population (number) in the four major regions of Ethiopia. 10](#_Toc450899411)

[Table 4. Evolution of approaches moving from Africa RISING in the Ethiopian highlands phase I to phase II 17](#_Toc450899412)

[Table 5. Long list of scaleable innovations currently being promoted to development partners for inclusion in Africa RISING phase II. 19](#_Toc450899413)

[Table 6. Targeted and potential beneficiary households for feed resources innovations 21](#_Toc450899414)

[Table 7. Crop varieties to be scaled with appropriate management practices 22](#_Toc450899415)

[Table 8. Proposed project areas and beneficiaries for phase II 23](#_Toc450899416)

[Table 9. Potential development partners for scaling input delivery-related innovations 26](#_Toc450899417)

[Table 10. Targets for input delivery innovations in four regions of Ethiopian highlands. 27](#_Toc450899418)

[Table 11. Targets for actual and potential beneficiary households from landscape management innovations 32](#_Toc450899419)

[Table 12. Implementation timeline for Africa RISING in the Ethiopian highlands phase II (year one) 37](#_Toc450899420)

[Table 13. List contacts representing core CGIAR partners in Africa RISING phase II 38](#_Toc450899421)

[Table 14. Outline budget (USD x 1000) for Africa RISING phase II in the Ethiopian highlands (1 October 2016–30 September 2021). 39](#_Toc450899422)

**Abbreviations**

ADA Austrian Development Agency

AEZ Agro-ecological zone

Africa RISING Africa Research in Sustainable Intensification for the Next Generation

AGP Agricultural Growth Program

AKT5 Agro-ecological knowledge tools

ARARI Amhara Region Agricultural Research Institute

ATA Agricultural Transformation Agency

CGIAR Consultative Group on International Agricultural Research

CIAT International Center for Tropical Agriculture

CIMMYT International Maize and Wheat Improvement Center

CIP International Potato Center

CLP Cereal, legume and potato

CRGE Climate Resilient Green Economy

CRP CGIAR Research Program

CRS Catholic Relief Services

CSA Central Statistics Agency

EIAR Ethiopian Institute of Agricultural Research

FEAST Feed Assessment Tool

FRG Farmer research group

GDP Gross domestic product

GIZ Gesellschaft für Internationale Zusammenarbeit

GRAD Graduation with Resilience to Achieve Sustainable Development

GTP Growth and Transformation Plan

ICARDA International Center for Agriculture Research in the Dry Areas

ILRI International Livestock Research Institute

ICRAF International Center for Agroforestry Research

ICRISAT International Crops Research Institute for the Semi-Arid Tropics

IFPRI International Food and Police Research Institute

IP Innovation platform

IWMI International Water Management Institute

M&E Monitoring and evaluation

MoA Ministry of Agriculture

NGO Non-governmental organization

NRM Natural resources management

OARI Oromia Agricultural Research Institute

PCA Participatory community analysis

R in D Research in development

R4D Research for development

RTS Rapid telephone survey

SARI Southern Agricultural Research Institute

SI Sustainable intensification

SLATE Sustainable livelihoods asset evaluation

SLM Sustainable land management

SNNPR Southern National Nationalities People Region

SWC Soil and water conservation

T Ton

TARI Tigray Agricultural Research Institute

TECHfit Technologies Fit

USAID United States Agency for International Development

**Summary**

Agriculture is the most important sector of the Ethiopian economy in terms of income and employment. Itaccounts for more than 46.6% of the gross domestic product (GDP) and 85% of the total employment. Food security, nutrition and income diversification of the rural farm households are major issues in Ethiopia. Africa RISING phase I managed to conduct exploratory and action research on various innovations (crops, livestock, NRM, input delivery systems) to respond to the demand of households and communities. In phase II, Africa RISING will work with more development partners and use the evidence/ innovations generated in phase I to reach more farmers and areas in the Ethiopian highlands. According to Africa RISING calculations, the proposed phase II activities, conducted in collaboration with development partners, will allow the project to reach nearly 0.5 million direct beneficiary households with the potential to scale to a further 3.4m households within the proposed zones of influence.

# Background and rationale

## Agriculture in Ethiopia

Ethiopia has an extremely diverse topography, climate, culture, population distribution and market access. The country is administratively divided into nine regions. Of the nine regions, Africa RISING has been operating in the highlands of four (Amhara, Tigray, Oromia and Southern National Nationalities People (SNNP) regions). The total population in Ethiopia is estimated to be more than 94 million, of which the four big regions constitute over 80% (Table 1). Seventy per cent of the population is engaged in agriculture.

Table 1. Population in major regions of Ethiopia

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Regions | Rural population | Percent of women | Urban population | Percent of women | Total population | Percent of women |
| Oromia | 28,169,000 | 50 | 4,647,000 | 50 | 32,815,995 | 50 |
| Amhara | 16,892,000 | 50 | 3,127,000 | 50 | 20,018,988 | 50 |
| SNNPR | 15,130,000 | 50 | 2,707,000 | 50 | 17,837,005 | 50 |
| Tigray | 3,760,000 | 51 | 1,200,000 | 51 | 4,960,003 | 51 |
| Total in the four regions | 63,951,000 | 50 | 11681000 | 50 | 75,631,991 | 50 |
| Total in the country | 75,265,000 | 50 | 19,086,000 | 50 | 94,351,001 | 50 |

Source: Central Statistical Authority (2013)

According to Ministry of Agriculture (MoA) (2000), Ethiopia has 18 major agro-ecological zones (AEZs) and 49 AEZs sub-zones. The AEZs classification is based on the basic ecological elements of climate, physiography, soils, and vegetation and farming systems. The 18 major AEZs are delineated and named by terms describing the broad moisture and elevation conditions of areas. A total of 49 agro-ecological sub-zones are identified based on homogeneity in terms of climate, physiography, soils, vegetation, land use, farming system and animal production.

Ethiopia has 12 potential vegetation types. The types are desert and semi-desert scrubland, Acacia-Commiphora woodland and bushland, wooded grassland of the western Gambella region, Combretum-Terminalia woodland and wooded grassland, dry evergreen Afromontane forest and grassland complex, moist evergreen Afromontane forest, transitional rainforest, Ericaceous belt, Afroalpine belt, riverine vegetation, fresh-water lakes and salt lakes (Friis et al. 2010).

Temperature and rainfall are the most important climatic factors for agricultural production in Ethiopia. Altitude is a factor that determines the distribution of climatic factors and land suitability; this influences the crops to be grown, rate of crop growth, natural vegetation types and their species diversity. Temperatures range from the mean annual of 34.5° C in the Danakil Depression, while minimum temperatures fall below zero in the upper reaches of Mt Ras Degen (4,620 meters). Between these extremes are vast areas of plateaux and marginal slopes where mean annual temperatures are between 10° and 20° C.

Rainfall in Ethiopia is generally correlated with altitude. Middle and higher altitudes (above 1,500 meters) receive substantially greater falls than do the lowlands. Generally average annual rainfall of areas above 1,500 meters exceeds 900 mm. In the lowlands (below 1,500 meters) rainfall is erratic and averages below 600 mm. There is strong inter-annual variability of rainfall all over the country.

The dominant agricultural enterprises in all agro-ecological zones are small-scale subsistence farms in the highlands and livestock rearing in the lowlands. Ethiopia grows large varieties of crops which include cereals (teff, maize, wheat, barley, sorghum, millet, oats); pulses (horse beans, chick-peas, haricot beans, field peas, lentils, soybean, and vetch); oilseeds (linseed, nigerseed, fenugreek, noug, rapeseed, sunflower, castor bean, groundnuts); stimulants (coffee, tea, chat, tobacco); fibers (cotton, sisal, flax.); fruits (banana, orange, grape, papaya, lemon, menderin, apple, pineapple, mango, avocado); vegetables (onion, tomato, carrot, cabbage); root and tuber (potato, enset, sweet-potatoes, beets, yams) and sugarcane. It is estimated that 16.5 million hectares is under cultivation and grains are the most important field crop, occupying 86% of area planted and being the chief element in the diet of most Ethiopians. The principal grain crops are teff, wheat, barley, which are primarily cool-weather crops; and maize, sorghum, and millet which are warm weather grain crops.

Cereals, pulses, oilseeds, vegetables, root crops, fruit crops, stimulant crops and sugar cane are cultivated by farmers and other agricultural sectors in Ethiopia. According to CSA (2015) report, cereals, pulses and oil crops contributed 81%, 12% and 7% of the grain production in the 2014/2015 cropping season (Table 2).

Table 2. Major crops and 2014/2015 crop production.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Crop Category | Total area (ha) | % | Total production (tons) | % |
| **Cereals** | 10,144,252 | 80.8 | 23,607,662 | 87.3 |
| Tef | 3,016,054 | 24.0 | 4,750,657 | 17.6 |
| Maize | 2,110,210 | 16.8 | 7,234,955 | 26.8 |
| Sorghum | 1,831,600 | 14.6 | 4,339,134 | 16.1 |
| Wheat | 1,663,838 | 13.3 | 4,231,589 | 15.7 |
| **Pulses** | 1,558,442 | 12.4 | 2,671,843 | 9.9 |
| Faba bean | 443,075 | 3.5 | 838,938 | 3.1 |
| Haricot beans (white) | 126,193 | 1.0 | 202,117 | 0.8 |
| Haricot beans (red) | 197,125 | 1.6 | 311,604 | 1.2 |
| Chick peas | 239,748 | 1.9 | 458,682 | 1.7 |
| **Oil seeds** | 855,750 | 6.8 | 760,099 | 2.8 |
| Neug/Niger seed | 252,584 | 2.0 | 224,463 | 0.8 |
| Sesame | 420,491 | 3.4 | 288,770 | 1.1 |
| Linseed | 82,324 | 0.7 | 83,131 | 0.3 |
| Source: Central Statistical Authority (2015) | | |  |  |

Ethiopia is believed to have the largest livestock population in Africa. The livestock sector is contributor to the economy of the country. Livestock products and by-products in the form of meat, milk, honey, eggs, cheese, and butter provide the needed animal protein that contribute to the improvement of the nutritional status of the population. Livestock also play an important role in providing export commodities—such as live animals, hides, and skins—to earn foreign exchanges for the country. On the other hand, draught animals provide power for the cultivation of the smallholdings and for crop threshing virtually all over the country and are also essential modes of transport for smallholder farmers. Livestock also provide a certain degree of security in times of crop failure, as they are a ‘near-cash’ capital stock. Furthermore, livestock provide farmyard manure that is commonly applied to improve soil fertility and also used as a source of energy. The four regions comprise 89% of the country’s cattle, small ruminants and equines population (Table 3).

Table 3.Livestock population (number) in the four major regions of Ethiopia.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Livestock species | Tigray | Amhara | Oromia | SNNPR | Four regions total | Country total |
| Cattle | 4,578,181 | 14,710,911 | 22,925,730 | 11,215,636 | 53,430,458 | 56,706,389 |
| Sheep | 1,817,305 | 10,024,277 | 9,715,587 | 4,580,220 | 26,137,389 | 29,332,382 |
| Goats | 4,255,290 | 6,064,944 | 7,849,924 | 5,092,628 | 23,262,786 | 29,112,963 |
| Horses | 3,54 1 | 420,7 6 0 | 1,222,760 | 382,92 7 | 1,222,760 | 2,033,115 |
| Mules | 5,754 | 157,213 | 156,331 | 78,334 | 397,632 | 400,329 |
| Donkeys | 753,450 | 2,677,429 | 3,007,027 | 630,492 | 7,068,398 | 7,428,037 |
| Camels | 55,921 | 66,364 | 239,357 | 2,865 | 364,507 | 1,164,106 |
| Poultry | 6,189,848 | 18,031,121 | 20,076,129 | 10,433,773 | 54,730,871 | 56,866,719 |
| Beehives | 250,598 | 1,361,329 | 2,864,320 | 1,127,618 | 5,603,865 | 5885263 |
| Source: Central Statistical Authority (2015) | | | | | | |

## Rationale

Agriculture is one of the six sectors that the government of Ethiopia has given much emphasis in its second Growth and Transformation Plan (GTP II—2015/16―2019/20). Increasing agricultural production and productivity focusing on smallholder agriculture is a continued priority. The major agriculture and rural transformation targets included in the GTP II plan are increasing crop and livestock production and productivity, promoting natural resource conservation and utilization, ensuring food security and disaster prevention and preparedness. An integrated systems approach and intensification on smallholders’ farms supported by research is indispensable to bring the desired change on the livelihood of the poor. The Africa RISING phase I and II research for development (R4D) and research in development (R in D) initiatives are in line with the Ethiopian government effort.

# Challenges and opportunities

Africa RISING in the Ethiopian highlands conducted systems understanding/ diagnostic activities in the first one and half years using more than nine tools and approaches. They are Rapid telephone survey (RTS), livelihood survey using the sustainable livelihoods asset evaluation (SLATE), participatory community analysis (PCA), IMPACTlite survey: Household detailed characterization, survey on Agro-ecological knowledge, community knowledge groups (AKT5 tool), feed assessment tool (FEAST) and technologies fit (TECHfit) and market/ value chain studies. The tools and approaches enabled to identify challenges, opportunities and research needs in Africa RISING sites and beyond.

Challenges:

* Climate variabilities (late onset and early cession of rain)
* Depletion of soil fertility (acidity, continuous cropping), soil erosion and drainage problem plus high fertilizer price.
* Soil loss on cultivated land without soil conservation equals 40 t ha-1 yr-1
* Low crop yield due to lack of improved varieties (< 1 t ha-1)
* Crop pests, weeds and diseases, poor access to agro-chemicals and post-harvest losses (30-40%)
* Lack of improved farm implements
* Shortage of animal feed (average deficit in the past few years in Ethiopia equals 46 million t DM yr-1)
* Poor access to veterinary drugs and animal health services
* Water shortage during the dry periods for human and livestock
* Shortage of wood for fuel (projected demand for 2020 is 92 million M3)
* Poor household nutrition (diets lacking protein and vitamins)
* Weak farm-to-market links

Opportunities:

* Ethiopian government five-year growth and development plans—the Africa RISING phase II program is in line with the [GTP II](http://www.ata.gov.et/ta/gtp-ii-overview/) plan. The government has also initiated a Climate-Resilient Green Economy ([CRGE](http://www.undp-aap.org/sites/undp-aap.org/files/Ethiopia%20CRGE%20Strategy%20Final.pdf)) strategy in 2011 to help the country realize its ambition of reaching middle-income status before 2025.
* Many development projects that have common agenda with Africa RISING are operating in Ethiopia, e.g. Agricultural Growth Program (AGP), sustainable land management (SLM).
* There are regional and federal research institutions and many CGIAR centers that can support the Africa RISING project in the Ethiopian highlands.
* There is a very good extension set up in Ethiopia that can support scaling at local level.
* The establishment of the ministry of livestock and fisheries as a separate ministry.

# Achievements and lessons from phase I

## Achievements:

The achievements of the Africa RISING phase I project in the Ethiopian highlands (2012―2016) form a springboard that we will use to generate developmental impacts with our partners during the proposed phase II. These achievements fall broadly into three categories:

1. **Research and development**. During phase I, the project has implemented more than 30 research protocols (16 exploratory and 17 action-oriented) focused on improving the food security, nutrition and health and income-generating capacity of our target households through sustainable intensification (SI). The project’s research outputs have been associated with clear biophysical, economic or social benefits to stakeholders. In addition, there is clear evidence that implementing these research-derived innovations can lead to measureable development outcomes and that they are suitable for scaling via appropriate development partnerships. In the case of the highlights presented below, we already have emerging evidence of scaling of these research outputs.
2. **Communications and learning (C&L)**. The backbone of current scaling efforts comes from the project’s communications products and learning experiences. C&L outputs will expand to support scaling partner efforts during phase II.
3. **Partnerships**. Implementation of an R4D / R in D approach requires an inclusive approach to partnership formation and support. One of the successes of phase I was the strength and breadth of its partnerships (from farmers to research and development actors). These partnerships are already starting to take us to scale and we will continue to support and expand them into phase II. Our experiences in partnership ‘management’ will stand us in good stead for the more intensive partner engagement that the approach proposed for phase II will require.

## Research and development highlights

* **Crop production yield gaps closed**. Africa RISING technologies have been used as a basis for regional benchmarks in crop production which sees a potential scaling domain of several million households. Our collaborators in the Tigray zonal and woreda office of agriculture were initially skeptical as to the yields achieved (e.g. up to 9.4 t / ha for wheat on demonstration plots and 8.6 t/ha under farmers management conditions). The highest yield (6 t/ha) and quality seed of faba bean also recorded in Africa RISING site in Tigray. However, they have been a strong and active partner in Africa RISING since the project’s inception and this close engagement and familiarity with the project’s approaches and activities gave them confidence to adopt these yields as best practice benchmarks.
* **Viable approaches for community seed supply**. Farmers that participated in community seed multiplication, e. g, potato, have been able to produce enough to sustain their annual food demand and sale to generate more income. Some women and men farmers in Endamehoni and Sinana sites have sold potato seed and bought water pumps and carts to provide service and generate additional income.
* **Seasonal livestock feed gaps closed**. The attitude of farmers on the production of improved animal feed is changing dramatically. Farmers have started allocating much larger land areas (>0.25 hectares) to produce oat/ vetch mixtures for animal feed. This is being supported by the project effective targeting and follow-up. The oat/ vetch mixtures are a source of nutritious feed in a cereal crop residue dominated feeding system and have been found to be a potential rotational intervention to break mono-cropping and disease infestation in Sinana, Bale Africa RISING site.
* **Fertilizer recommendations fine-tuned**. Research was conducted on crop responses to various combinations of fertilizer blends in the wheat-based cropping systems. It was possible to identify soil-specific best fertilizer blends and rates for wheat in target eight research kebeles. New recommendations boost yields two―three times, even in previously ‘non-responsive’ soils; may include N-P-K plus Sulphur, zinc, boron. As a result of research into targeting of micro-nutrients in fertilizer has catalyzed a new national initiative to deliver these innovations countrywide.
* **Soil losses reduced and productivity improved at a landscape scale.**Implementation of integrated soil and conservation (SWC) practices at landscape scale reduced soil loss by over 80%. At plot level, management practices implemented at cultivated fields reduced soil loss by 87% compared to non-treated plots in the Basona and Lemo Africa RISING sites. Improved water lifting technologies enhanced farmers ability to irrigate high value crops and improve household nutrition. Irrigated fodder biomass increased by 14% dry weight when farmers were guided in their irrigation practice by the wetting front detectors in the Lemo Africa RISING site.

## Communications and learning highlights

* During phase I we have published 124 blog posts, 169 evidence briefs and numerous posters, reports and brochures highlighting our work and communicating our findings to potential users and beneficiaries. In addition, our research teams have drafted 11 journal articles that are now at various stages of the peer review process.
* The project has supported formal higher-level training for long-term capacity development through the attachment of 30 MSc and PhD students to its research protocols. Some of these students are now writing up their research and their findings will strengthen that conducted by the Africa RISING partners due to its focus on more specific issues related to SI processes.
* The project has organized a series of field days, knowledge sharing forums and short-term trainings. During the period 2013–2015, nearly 11,000 individuals participated in these activities.
* The project’s work in Ethiopia has generated significant media coverage at both national and regional levels. For example, our work on introducing a two-wheel (single axle) tractors to power agriculture in the highlands of Ethiopia and further unlock the potential for SI was intensively covered in the national press.
* In recognition of the achievements of Africa RISING in the Ethiopian highlands in the area of C&L, the project won an [award](http://usaidlearninglab.org/library/learning-and-collaboration-dna-next-generation-agricultural-research), sponsored by the USAID Learning Laboratory in 2015, for its success in collaborating, learning and adapting around its innovations.
* The project installed eight weather stations that would generate climate information for research kebeles and beyond. The climate information already collected helped to develop crop modelling in Basona and Lemo Africa RISING sites. Similarly, the meteorological data is used for supporting student thesis research.

## Partnership highlights

* The first phase of the Africa RISING project in the Ethiopian highlands was based around four field sites, one in each of the main highland regions (Amhara, Oromia, SNNPR and Tigray). In addition to establishing a project presence at each site (site coordinator and assistant site coordinator), we have fostered a strong network of local partners encompassing six higher learning institutions, two federal and four regional research organizations, and four woreda extension offices, all of whom have worked closely with Africa RISING farmers in our eight research kebeles. As the project expanded, our partnerships, in particular our development partnerships, have also expanded to include a number of NGOs and private sector actors. Although the project was initially strongly focused on the diagnosis of constraints and opportunities and technology testing and validation, having the engagement of development partners from the beginning has offered a number of benefits. Early engagement has meant that development partners’ perspectives have been mainstreamed into all of our innovations. Also, as we move towards wider scaling, our relationships with development partners, many of whom will participate in the proposed scaling activities of phase II, are based on mutual trust established over the project’s entire life span.
* Our [innovation platforms](http://africa-rising.wikispaces.com/Innovation+platform) (IPs) and other structures for multi-stakeholder engagement have played an important role in making our partnerships successful. The project established eight kebele level and four woreda level IPs to support innovation and cross-learning. A set of farmer research groups (FRGs) clustered around specific research themes (e.g. feeds and forages) formed a channel for linking the IPs to the households participating in the action research. The IPs have been very active and engaged in phase I and have made direct inputs into focusing and prioritizing the research. The woreda level IPs have reviewed all research proposed for their sites, in some cases rejecting research that they did not consider appropriate or high priority. The FRGs have formed the basis for engagement of the research teams at household level using an elective model for determining households’ participation in specific research protocols. This model has been instrumental in building strong trust in our target communities where, in the past, farmer participation in specific activities may have been dictated by research teams.
* Although Africa RISING’s funding from USAID has come from outside the CGIAR Research Programme (CRP) framework, USAID still wished to embrace some of the principles underlying the establishment of the CRPs. In particular, the project was required to engage with other CGIAR centers to collaborate in the kind of multi-disciplinary research that, it was postulated, should be most effective in addressing issues around SI. Phase I of Africa RISING in the Ethiopian highlands has been a true partnership of eight CGIAR centers[[1]](#footnote-1) with each center given the opportunity to emphasize their own priorities, whilst engaging with other centers to address some of the wider systemic issues. These partnerships have been like any other partnerships in that they can raise day-to-day challenges. However, we have generally seen strong collaboration amongst centers, enforced initially by a ‘minimum two centers’ rule for all research protocols. We now have real evidence that Africa RISING in the Ethiopian highlands has moved from the set of individual center components found in most multi-center projects to genuine team-working across centers as, for example, in the case of the cereal-legume-potato (CLP) group formed by CIP, CIMMYT and ICARDA or the collaborations amongst ILRI, ICRAF and IWMI on the introduction of tree crops.

## Lessons

During phase I, the project has learned a number of lessons that will be key to designing an effective phase II that will generate development impacts at scale. These include issues around partnerships, capacity development, research management, budget utilization and specific approaches to exploratory and action research. The most significant of these lessons include:

* Realizing the benefits of integrating SI interventions at household scale has been a mantra for all three Africa RISING projects during phase I. In practice, we have learned that integration of SI interventions does not happen concurrently. Farmers prefer to test one or two technologies at a time in order to assess workability and the benefits that they derive from them. Once they become confident with a limited number of technologies, they often proceed further down the intensification pathway by adopting further complimentary interventions. This stepwise approach to SI appears to be the reality for many farmers.
* Balancing short- and long-term benefits for households and communities is necessary to engage more farmers in the action research processes and reach more communities and areas.
* Tailoring technologies to local farm and landscape situations requires careful attention in order to get support from communities, extension and policymakers. This applies from the kebele to federal government level.
* Partnerships are key to bringing about the desired impacts. Engagement of local partners ***throughout*** the R in D process, building their capacity through a well-managed capacity building strategy and bridging gaps in facilities helps to build strong relationships and create positive working environments.
* The presence of Africa RISING project site coordinators and their assistants at site level was invaluable in facilitating communication amongst CGIAR centers and local partners and to follow up on the on-farm research. This model will evolve for phase II (section 5) but could be broadly scalable to similar projects managed by CGIAR centers.
* The attachment of students for specific pieces of research is a cost effective approach for generating evidence on the management, utilization and effects of technologies, and bridging information gaps at both household and landscape levels.
* Periodic cross-learning visits can motivate farmers and extension agents to learn and adapt successful technologies and practices to their own localities.
* IPs and FRGs have greatly enhanced communication among CGIAR and local partners, farmers and local policymakers on understanding system, identifying opportunities, conduct of research and review of results and impacts.

# Operational approaches for phase II

With the shift of emphasis towards partnerships for scaling in this proposed phase II, there will be a number of evolutionary changes to the way in which Africa RISING will operate. The key changes are summarized in Table 4.

Table 4. Evolution of approaches moving from Africa RISING in the Ethiopian highlands phase I to phase II.

|  |  |  |
| --- | --- | --- |
| Operational issue | Phase I | Phase II |
| Scale of area covered | Limited to few woredas and kebeles. | Extending to more woredas, and kebeles with coordination at zonal/ regional level. |
| Research approach | Generic research on technology identification, testing and validation. | Primarily research to backstop scaling initiatives with development partners. |
| Partnership | Primarily with disciplinary experts and farmers. | Moving towards stronger development partnerships. |
| Scaling | Ad hoc dissemination and scaling arising from technology generation and demonstration activities. | Systematic horizontal and vertical scaling of phase I innovations with development partners. |
| Targets | Direct beneficiaries engaged in technology development and numbering thousands (high cost per beneficiary). | Direct beneficiaries engaged via development partners and numbering hundreds of thousands (< $50 per household). |
| Innovation platforms | Implemented at kebele and woreda level (section 4.1.3). | Participating in or seeding IPs at regional and national levels. |
| Capacity development | Focused more on student attachments to support the action research interventions | Students will be attached to support the research in development innovations |
| Site coordination teams | Based in woredas with specific responsibilities for the research conducted in that woreda. | Broader role to support the backstopping research and manage development partnerships at zonal level and beyond. |
| Monitoring and evaluation | *Ad hoc* monitoring via field visits and innovation platform meetings. Largely case study based and opportunistic. | Greater quantitative emphasis. Formal beneficiary tracking system to capture formal/ informal technology dissemination. Implement SI indicator framework. |

# Implementation

## Research questions

The research questions for the project in the Ethiopian highlands will seek to elaborate on the generic research questions presented in the umbrella document for issues, identified largely during phase I, that are specific to this regional project. The research questions addressed by our specific activities will contribute insights from specific SI-related activities and geographic areas within the country.

### Trade-offs and synergies:

Umbrella research question: What are the environmental, economic, human and social consequences (according to the SI framework) of productivity-enhancing interventions? And what are the productivity-enhancing consequences (according to the SI framework of environmental-, economic-, human- and social-enhancing interventions?

* Which SI domains are most significant in the household livelihood systems of the Ethiopian highlands?
* How are these domains influenced by the introduction of Africa RISING technologies?
* How can trade-offs be minimized and synergies promoted for the key SI domains?

### Adaptation and adoptability:

Umbrella research question: How are these interventions aiming at increasing productivity and environmental conditions adapted to the endowments of diverse farmer typologies in the target areas?

* What are the productivity impacts of our interventions and combinations of these at scale?
* Who benefits from which interventions?
* How can these benefits be equitably distributed?

### Livelihoods:

Umbrella research question: How do changes in the management of specific activities or combination of activities within a farm (e.g. a field or a livestock unit) affect overall livelihood conditions for different farmer typologies?

* What are the broader dimensions of household livelihoods in the zones of influence for Africa RISING in the Ethiopian highlands?
* Are the net benefits of scaling the technologies developed and tested by Africa RISING during its first phase positive when viewed through an inclusive livelihoods lens?

### Enabling environments:

Umbrella research question: How do enabling conditions affect the nature (variety, agro-inputs, complexity, diversity) of promising interventions moving towards SI?

* What are the specific enabling conditions for the most adoptable interventions in the Ethiopian highlands?
* How can these be ensured (e.g. partnerships and policies required)?

### Equity:

Umbrella research question: How does social capital affect community productivity, cooperation and wellbeing along with the scaling of SI innovations?

* In the broadest sense, what are the key stakeholder groups associated with scaled SI in the Ethiopian highlands?
* How are these groups differentially affected?
* Are any of them adversely affected to extents that are unacceptable and cannot be compensated for?

## Research activities

The research activities conducted under the proposed phase II fall into two categories.

### Generic

The first priority of the proposed Africa RISING phase II is to deliver research outputs that directly support a set of partnerships for scaling the research outputs of the project’s phase I. However, the SI paradigm is relatively new and, in order to understand the processes and enabling environments for achieving SI, it is likely that we will need to continue funding research of a more generic nature. The detailed research protocols will need to be responsive to the emerging needs of the project, but are likely to cover the following principal areas:

* Completing promising research lines initiated under phase I such as production of alfalfa forage and seeds, food and feed from sweet lupin, diversification of home-gardens, participatory variety selections and others. Funding for this activity is likely to be limited and will be restricted to research that is already able to demonstrate very strong potential to become the foundation of an effective R in D partnership;
* Evidence gathering for the outcomes and impacts of SI; and
* Systems level meta-analyses of Africa RISING innovations working together.

Partners’ proposals for generic research in phase II will be peer reviewed by the proposed Project Advisory Group.

In addition to generic research funded directly by the Africa RISING project in the Ethiopian highlands, we have the opportunity to partner in generic research activities funded by other USAID initiatives, such as the Sustainable Intensification Innovation Laboratory (SIIL) managed by Kansas State University. Our current involvement in SIIL’s initiative to develop a robust SI indicator framework is an example of this kind of partnership.

### Backstopping

Most research conducted under Africa RISING’s phase II will be linked to a set of scaling partnerships using the model described in the umbrella document and building on our existing partnerships with development actors (see section 4.1.3). We have a number of scaling partnerships that have been established on an *ad hoc* basis (section 4.1.1) but, for phase II, we will implement a more systematic portfolio of scaling partnerships with Africa RISING providing the resources required to conduct backstopping research that will increased the viability of the innovations to be scaled.

Initial work to identify innovations developed, tested and validated during phase I that would be ready to scale during the proposed phase II was carried out during our ‘review and planning’ meeting in February 2016. A total of 12 potential scaling initiatives were identified (Table 5).

Table 5. Long list of scaleable innovations currently being promoted to development partners for inclusion in Africa RISING phase II.

|  |  |
| --- | --- |
| Title | Lead institution |
| Feed resources innovations–scaling at farm and watershed level | ILRI |
| Scaling improved barley, food legumes and potato technologies | ICARDA |
| Scaling-niche-specific input delivery systems | ICRISAT |
| Agricultural rain/ irrigation water management for SI and smallholders resilience building | IWMI |
| Intensifying and diversifying home-garden and farm level agro-ecosystems | ICRAF |
| Creating climate-smart multifunctional landscapes through restoration, ecological intensification and diversification | CIAT |
| Scaling enset research innovations through IPM approaches | Areka / SARI |
| Scaling up high value multipurpose trees and their management practices from homestead to landscape | ICRAF |
| Improving the management of smallholder plantations in farms and watersheds | CIFOR |
| Scaling research technologies through agro-enterprise development | CIMMYT |
| Mainstreaming nutrition, postharvest technology and gender in SI | CIP/ ILRI |
| Scaling IP approaches | ILRI |

These scaling proposals are at various stages of development. We have selected five, relatively advanced examples of proposals for inclusion in this document in order to illustrate the thinking behind them. However, all of the above scaling proposals might ultimately form part of the activities under phase II and some of the examples given might, ultimately, fail to meet all the criteria for backstopping research support. In order to secure funding, backstopping research associated with scaling partnerships will need to:

* Be based on Africa RISING, and associated, research outputs that are validated for development outcomes.
* Have secured a quantifiable contribution from a clearly identified set of development partners (either monetary or in kind). Documentary evidence of this commitment will be required before research funding is committed.
* Have clearly defined targets with full explanation of how these figures have been arrived at;
* Not require any funding from Africa RISING for inputs or capital equipment that will be distributed to beneficiary household. Any such costs must be met by development partners.

Final selection will be undertaken through peer review by the PAG.

## Example scaling partnerships

Of the 11 scaling partnership proposed during the review and planning meeting, and listed in Section 6.2.2, the following four have been selected as currently the most mature examples in terms of identification and communication with scaling development partners. Highlighting these as examples does not mean that these four proposals will definitely form part of the phase II activities. Due diligence procedures will be used to validate all the partnerships proposed and their capacity to contribute to the desired outcomes. Any of the remaining proposals under development have an equal chance of support from Africa RISING phase II (at any stage) if they can develop sound development partnerships and cost-effective targets (< $50 per household). Other partnerships may emerge during phase II and, where these are credible, we will endeavor to support them.

### Feed resources innovations–scaling at farm and watershed level

##### Innovations to be Scaled

This scaling partnership will take an integrated approach to promoting a portfolio of feed-related innovations that have been validated by Africa RISING. The aim will be to promote the adoption of these innovations, either individually or in combination, to meet the needs of the direct beneficiary households. They key interventions are:

* *Supplementary forage from rainfed/ irrigated oat–vetch mixtures*. Mixed oat–vetch forage is productive and also high in energy and protein. It can be used as a supplement to locally available feed resources for ruminant livestock.
* *Fodder from tree lucerne.*Tree lucerne is a leguminous tree that is adapted to the Ethiopian highlands. On well-drained soils, it can produce up to 4 t ha-1 year-1 of high protein forage.
* *Desho grass for feed and land stabilization.* Desho is an indigenous grass that can be used to stabilize soil bunds and provide nutritious forage at the same time.
* *Intercropping forages with faba bean.* Many farmers depend on crop thinnings and weeds from cropped plots for feeding livestock at certain times of the year. Replacing this *ad hoc* practice with more formal intercrops increases both forage and crop productivity.
* *Improved feed troughs and storage structures.* Feed spoilage and other waste is a significant factor contributing to feed shortages. These interventions can effectively increase feed availability by up to 50% under on-farm conditions.
* *Ration formulation based on nutritional composition of feeds.* Scientific ration formulation offers a means of ensuring that the range of improved quality feeds introduced under this scaling initiative will be efficiently use for maximum benefit.

##### Development Partners

We have a number of development partners who are committed to scaling some of the innovations described in section 6.3.1.1.

* The southern Tigray zonal office and the extension in Endamehoni woreda, are scaling feed troughs and oat–vetch mixtures to similar kebeles and woredas within the zone. These activities will be expanded under this scaling initiative. In addition, a local NGO called GRAD is committed to scale out feed resources innovations such as oat-vetch for sheep fattening and feed trough in Endamehoni woreda.
* Farmers, zonal and woreda extension in Hadiya-Lemo, north Shewa-Basona, and Bale-Sinana are demanding the oat-vetch, tree Lucerne, feed trough and storage innovations for implementation.
* At local level, AGP works closely with the government extension system and supports their development initiatives both technically and financially. Joint planning with AGP will increase the resources available to this scaling initiative with a focus, particularly on the Feed the Future zones of influence. AGP focal persons are already members of the innovation platforms in Sinana, Basona and Endamehoni Africa RISING sites.
* A number of NGO partners are expressing interest in these technologies and are, in principle, considering integrating them into their programs; Inter Aide France and Catholic Relief Services (Wolaita, Kambatta and Hadiya zones).
* GIZ has expressed interest in tree Lucerne and other forage innovations for scaling at farm and watershed levels in Amhara, Oromia, SNNP and Tigray regions. These technologies are considered to be complementary to their efforts in sustainable land management for soil and water conservation.

##### Targets and Zones of Influence

The feed resources innovations will be initially scaled (horizontally and vertically) in four zones with the aim of implementing in 51 woredas (793 kebeles). The rural population in Ethiopia is estimated to be over 71 million of which around 16.5 million are livestock keepers. The beneficiary calculations in Table 6 are on the scope of engagement for this initiative in relation to the total rural population and numbers of livestock keepers.

Table 6. Targeted and potential beneficiary households for feed resources innovations.

|  |  |  |  |
| --- | --- | --- | --- |
| Region / zone | Number of woredas/ kebeles | Potential beneficiaries | Direct beneficiaries |
| Amhara/ North Shewa | 22/ 300 | 233,136 | 54,066 |
| Tigray/ South Tigray | 5/ 56 | 85,896 | 19,920 |
| Oromia/ Bale | 15/ 164 | 106,018 | 24,586 |
| SNNPR/ Hadiya | 9/ 273 | 140,795 | 32,652 |
| Total |  | 565,845 | 131,224 |

### 

### Scaling out of improved barley, food legumes and potato technologies for food security, income and feed in the central and northern highlands of Ethiopia

##### Innovations to be Scaled

Table 7 lists the crop varieties, to be scaled in phase II that were tested and validated during phase I. These varieties and the management practices required to realize their yield potential were the farmer-preferred varieties for the four regions. During phase II they will be scaled within and beyond the existing Africa RISING sites.

Table 7. Crop varieties to be scaled with appropriate management practices.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| No. | Crop | Tigray | SNNP | Amhara | Oromia |
| 1 | Food barley | HB1307 | HB1307 | Cr.41/98, Agegnehu | Abdene, HB1307 |
| 2 | Malt barley | Bekoji-1 | Bekoji-1 | Bekoji-1 | Bahati, Bekoji-1 |
| 3 | Faba bean | Dosha | Tumsa | Dosha | Gebelcho, Dosha |
| 4 | Durum wheat | Mangudo | Ginchi | Utuba | Utuba |
| 5 | Lentil | Alemaya |  | Derash | Derash, Alem Tena |
| 6 | Field pea | Gume | Bilalo | Bilalo, Burkitu | Burkitu |
| 7 | Chickpea | Arerti | Arerti | Arerti | Arerti |
|  |  | Habru | Habru | Habru | Habru |
| 8 | Potato | Gudene | Belete, Jalene | Gorebella | Belete, Gudene |

##### Development Partners

All cultivars of barley, durum wheat, faba bean, field pea, lentil and potato that are targeted for scaling will be those preferred by farmers and the industry. To catalyze the process, external funding and alignment to the country’s development strategy is required. The crops and locations to be used in the scaling project are aligned to crops and areas identified by Ethiopian Agricultural Transformation Agency (ATA) for the newly developed agricultural commercialization clusters. Commercial clusters are selected based on potential for production and marketing of a particular commodity. ATA has identified wheat and malt barley in Oromia region and wheat in SNNPR and Tigray for commercialization. Indeed the required institutional and policy environment do exist to sustain scaling-up efforts beyond the intervention or the Africa RISING project’s duration. The cereal, food legumes and potato are priority crops in the government five-year plan for food and expand alignment to GTP II (2015―2020) and AGP (2015―2020), bureaus of agriculture in the districts are supporting local seed production through farmer groups, women groups and youth groups, and the government-introduced Quality Declared Seed scheme for expansion of availability of quality seed involving farmer seed producers are in place.

Phase II will link to and creating synergies with other ongoing projects, especially USAID-Malt Barley and faba bean project, an ICARDA project on ‘Deployment of malt barley and faba bean varieties and technologies for sustainable food and nutritional security and market opportunities in the highlands of Ethiopia’, USAID-BPBL (Better Potato for a Better Life), a CIP Project on ‘Exploiting the potential of potato and sweet potato to reduce food insecurity and dependence on cereals’. Both projects have ongoing activities in the highlands of Amhara, Oromia, SNNPR and Tigray. An ICARDA-funded USAID project ‘Better livelihoods for small holder farmers through knowledge based technology interventions in the highlands of Ethiopia: Increasing the productivity of chickpea in wheat-based cropping system’ will also be aligned to this scaling project.

We are now in contact with bureaus of agriculture (Bassona Worana in North Shoa, Endamehoni, South Tigray and Sinana, Bale zone) to start with, breweries (Meta diego, Dashen and Raya), malt factories (Assela Malt factory and Gondar Malt factory) and food factories (Kalyti Pasta and Macaroni factory), bilateral projects [ICARDA-led bilateral projects: Malt barley-Faba bean project which is funded by USAID and barley-faba bean yield gap project funded by Austrian Development Agency (ADA)], Ethio-Italian Durum wheat value chain project, Global Malt Service and Research Centers (Alamata, Debre Birhan, Sinana RCs), universities (Meda Wollabu University). We are committed to work for greater impact, effective partnership and diversified funding during Africa RISING phase II.

##### Targets and zones of Influence

The scaling intends to include both vertical and horizontal integration, by reaching out to policy makers and extending reach to 17 districts and 68 kebeles. A total of 104,641 households will be direct beneficiaries in the four regions (Table 8). Farmers, seed growers, national agricultural research centers, government extension department and industry are the key drivers.

Table 8. Proposed project areas and beneficiaries for phase II

| **Region/ zone** | **Number of woredas/ kebeles** | **Commodity** | **Potential beneficiaries (households)\*\*** | **Actual beneficiaries (households)** | **Area (ha)** | **Seed (ton)** |
| --- | --- | --- | --- | --- | --- | --- |
| SNNP/ Hadiya | 3/12 | Barley | 78,856 | 1872 | 468 | 46.8 |
|  |  | Durum wheat | 163,228 | 6048 | 1511.6 | 226.8 |
|  |  | Faba bean | 102,252 | 2616 | 652.8 | 130.56 |
|  |  | Field pea | 42,567 | 1392 | 347.8 | 52.2 |
|  |  | Chickpea | NA | 1596 | 398.4 | 55.8 |
|  | 15/30 | Potato technology | 180,000 | 30,000 | 750 | 1,500 |
| Oromia/ Bale | 5/20 | Barley | 94,215 | 5655 | 2484 | 248.4 |
|  |  | Durum wheat | 170,579 | 5115 | 2557.5 | 383.625 |
|  |  | Faba bean | 43,544 | 2595 | 666 | 133.2 |
|  |  | Field pea | 19,972 | 1200 | 300 | 45 |
|  |  | Lentil | 10,159 | 615 | 154.45 | 12.3 |
|  |  | Chickpea | 8,810 | 540 | 126 | 18.9 |
|  | 8/15 | Potato technology | 90,000 | 15,000 | 375 | 750 |
| Amhara/ North Shewa | 6/24 | Barley | 203,184 | 11509 | 2926.05 | 292.605 |
|  |  | Durum wheat | 219,192 | 6205 | 1552.05 | 232.9 |
|  |  | Faba bean | 207,779 | 9486 | 2373.2 | 474.64 |
|  |  | Field pea | 87,718 | 2686 | 673.2 | 100.48 |
|  |  | Lentil | 103,983 | 5032 | 1258 | 113.22 |
|  |  | Chickpea | 76,098 | 3995 | 999.6 | 140.08 |
|  | 8/15 | Potato technology | 90,000 | 15,000 | 375 | 750 |
| Tigray/ South Tigray | 3/12 | Barley | 145,306 | 11604 | 2901.55 | 290.145 |
|  |  | Durum wheat | 367,081 | 14688 | 3672 | 550.8 |
|  |  | Faba bean | 25,580 | 1024 | 230.4 | 46.08 |
|  |  | Field pea | 18,443 | 288 | 72 | 10.8 |
|  |  | Lentil | 20,988 | 900 | 225.6 | 20.4 |
|  |  | Chickpea | 37,473 | 1992 | 499.2 | 69.89 |
|  | 6/13 | Potato technology | 60,000 | 10,000 | 250 | 500 |
| **Total** | **54/141** |  | **2,667,007** | **174,641** | **77,508.75** | **7,196.115** |

### Scaling niche-specific Input delivery systems in the Ethiopian highlands

[Revised version to be added}

##### Innovations to be Scaled

##### Development Partners

##### Targets and Zones of Influence

### Scaling up high value multipurpose trees and their management practices

[Revised version to be added}

##### Innovations to be Scaled

##### Development Partners

##### Targets and Zones of Influence

### Creating climate-smart multifunctional landscapes through restoration, ecological intensification and diversification at different scales

##### Innovations to be Scaled

This initiative has two main foci; the application of tools and approaches for sustainable innovation at a landscape scale and the evaluation of the aggregated effects of Africa RISING interventions when they are scaled at numerous locations within a landscape.

Tools and approaches include:

* Hotspot mapping for targeted investment planning;
* Capacity development through trainings and cross-learning;
* Farmer-led, participatory approaches to ecosystem-based management of landscapes;
* Decision-support tools for matching option combinations to landscapes; and
* Application of a generic landscape planning and management tool.

This initiative will potentially encompass the whole range of Africa RISING technologies as they are applied across landscapes. However, several of these have specific implications in the creation of climate smart landscapes, including:

* Afforestation and introducing agroforestry;
* Integration of physical and biological SWC measures;
* Water access and management options;
* Feed-smart SLM interventions;
* Integrated soil fertility management.

These will form the core focus of interventions to be promoted actively alongside this initiative.

##### Development Partners

In phase II, we will continue collaborating with the office of agriculture, local universities, research centers, farmers and NGOs. We explored the various institutions with common interest and which can help out-scaling interventions. We believe that the SLM program of the Ministry of Agriculture will be interested to collaborate with the project as they also implement SLM practices across selected watersheds. We will also try to synchronize our sites with those of SLM so that we co-invest and share experiences. Through our partner, Mekelle University, we have already received confirmation that SLM (district level) will be willing to foster collocation with us in some of their watersheds in South Wollo. They are prepared to invest and will be happy to get technical advice and capacity building from Africa RISING project. Our discussion with the Amhara region Agriculture Bureau Natural Resources Directorate indicated willingness to link with SLM, Safety Net and MERET programs, which will enable out-scaling Africa RISING technologies, tools and experiences. As we are aiming to create ‘climate-smart’ landscapes, the CRGE will also be interested to collaborate with the team. Based on our preliminary discussion on joint implementation of SWC/SLM interventions, the GIZ will be another partner which will collaborate and co-invest implementing our protocol. We have agreed to define gaps and identify areas of collaboration as well as define the modality. There is a possibility that we can implement some of our frameworks/tools and technologies. Recently, we discussed with EIAR Integrated Watershed Management Research Case Team leader and there is an overall agreement to collaborate on technology out-scaling. One potential aspect of collaboration includes intruding flues and gauging stations in some of their watersheds. Team members of the protocol are also leading discussions with other partners.

##### Targets and Zones of Influence

Initially, we will consolidate our interventions in the three regions of Africa RISING sites (Tigray, Amhara and SNNP). We will implement the various practices in one additional watershed to the existing ones. We will then add two other watersheds in the Amhara region aligned to SLM and GIZ watersheds. We will thus have a total of eight watersheds.

Within each watershed, we will consider landscapes of about 1,000 ha where the integrated practices will be implemented. With this, we will cover about 42,000 ha of land. Considering average land holding in Amhara, Tigray, SNNPR and Oromia is 0.75, 0.54, 0.89 and 1.15 ha, respectively (Birhanu et al. 2003), there will be around 51,027 households to be targeted.

We assume that there will be multiplier and off-site effect in the neighboring and other government-led and community-based watersheds at least in five watersheds in each of the Amhara, Oromia and SNNPR, and two watersheds in Tigray region. We also assume the size of each watershed on average is 1,000 ha. This means there can be about 20,333 households of other secondary beneficiaries. Totally, we will thus anticipate to impact around 71,360 households (Table 11). Average family size per household is estimated to be five.

With the integrated interventions, soil erosion will reduce by over 80% in the model landscapes. Water yield will improve by over 60%. Biodiversity will also improve. With such cumulative impacts, overall system productivity will be enhanced by over 75%.

Table 9. Targets for actual and potential beneficiary households from landscape management innovations.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Regions | Number of watersheds | Area (ha) | Actual  beneficiaries (households) | Potential/  secondary beneficiaries  (households) |
| Amhara | 12 | 12,000 | 16,000 | 6,666 |
| Tigray | 6 | 6,000 | 11,111 | 3,703 |
| SNNPR | 12 | 12,000 | 13,482 | 5,617 |
| Oromia | 12 | 12,000 | 10,434 | 4,347 |
| Total | 42 | 42,000 | 51,027 | 20,333 |

## Monitoring and evaluation arrangements

* Joint planning, implementation and M&E
* Exploratory studies
* Organization of different platforms for cross-learning and evaluation
* Use of SI indicators (productivity, environment, etc.)
* Placement of M&E expert (mid-level carrier)—recruited by ILRI and cost could be covered by IFPRI
* M&E on agronomic data will be managed by biophysical scientists/research teams and IFPRI will manage socioeconomic data.
* Data management
* Beneficiary tracking system will be in placed to capture informal dissemination of technologies and practices.

## Communications arrangements

In phase I,Africa RISING communication and knowledge sharing activities and tools helped us to:

* Inform, engage with and influence wide audiences;
* Translate outputs into outcomes, getting knowledge into use;
* Improve our effectiveness by enriching learning, interaction and exchange;
* Capture, publish and disseminate our products and outputs; and
* Improve internal communication, by linking and connecting teams.

Click <http://africa-rising.wikispaces.com/comms_tools> to know more about the tools employed during phase I.

The three regional projects had their own communication specialists who were responsible to make sure the communication and knowledge sharing activities were handled to begin the intended outcomes. In addition, ILRI–Addis Ababa led the program communication activities.

In phase II, Africa RISING communication and knowledge sharing activities will focus on five major areas. These are:

* Communicating with and for actors on the ground for the scaling out of technologies and practices;
* Communicating and knowledge sharing for policy influence to (multiply Africa RISING outcomes;
* Communicating about the program, the science and results throughout the program lifecycle;
* Communicating, engaging, learning and sharing for effective partnerships across scientists and development actors; and
* Communications for donor relations.

Though these activities are very broad, each region will have their own communication plan to put this activities in place according to their own context.

In the Ethiopian highlands project, various communication channels will be put in place to make sure the communication and knowledge activities reach the right audience, at the right time and through the right channels. These included but not limited to:

* Mass media (radio, television and print media);
* Website;
* Publications (newsletters, posters, flyers, Evidence briefs, policy briefs, technical reports);
* Social media (Yammer, Twitter, Facebook ...);
* Digital materials e.g. video-clips;
* Knowledge sharing and learning workshops e.g. innovation platform meetings;
* Exchange visits;
* Seminars;
* Targeted government meetings/conferences/policy dialogue; and
* Farmers field days.

# Relevance to cross-cutting issues

Major cross-cutting issues are gender, nutrition and capacity development. All the above strategies aiming at scaling-up successful agricultural intensification practices have positive impacts on health and nutrition if linked to improved outcomes in the dimension of gender roles and gender equity especially enhancing women’s access to and control over production, income and assets. Introduction of improved technologies and practices will increase women’s access to inputs and benefits from use of the inputs. Women and men carry out different roles and responsibilities in crop and livestock production and intensification can increase the women’s workload. Increasing availability of alternative feed resources will improve access to livestock feed by women and men, thereby reducing the time spent searching for feed especially amongst women. In phase II, labor allocation and time use will be assessed to aid adaption and scaling-up of technologies that reduce women’s labor and energy spent on both agricultural and household related activities.

In Africa RISING intervention areas, the problem of under-nutrition is widespread, stunting, wasting and underweight rates are 37%, 6% and 12% respectively. About 25% of households are food in-secured and overall dietary diversity is poor; 54% of children and 75% of households do not consume recommended acceptable diets (Nutrition situational analysis 2015). Intensification and diversification around homesteads by introducing fodder trees, high value fruit trees and vegetables around home gardens and watering points can enhance food and nutrition security of households. Increasing access to nutrient dense foods (sweet potato, potato, legumes) will improve nutrition and food security. Micronutrient deficiencies, notably vitamin A, zinc and iron are prevalent particularly amongst pregnant women and children under five (CSA 2014). Fertilizer application in different landscapes will enhance the content of micro-nutrients in crops, thereby increasing their availability in foods.

Most of the barriers to scaling up project interventions are related to gender norms and gender inequality within the cultural context where the intervention is implemented. Transformation of gender-constraining norms will be a necessity to facilitate wider adoption of technologies by women and control of the benefits from their own labor. Both gender-responsive and transformative approaches will be espoused to address gender-based constraints, facilitate changes in attitudes, practices and behaviors, and changes in norms which perpetuate gender inequalities.

The gender capacity of Africa RISING and its partners is a key success factor for mainstreaming gender throughout the project. Gender capacity of Africa RISING of staff and partners to conduct gender analysis and apply gender transformative approaches will be enhanced in phase II. In phase II there will be strategic gender training, as well as gender training integrated with training in other disciplines. Gender capacity development will increase incorporation of gender issues at implementation and policy levels. Africa RISING envisages a more holistic training package for farmers that combines technical issues with gender awareness, entrepreneurship and nutrition. Partners with the mandate to deliver on gender and nutrition will be identified and engaged with at different levels. Increasing production diversity alone is not enough. Therefore measures will be in place to support nutrition advocacy, behavior change and capacity building to enhance nutrition outcomes (dietary diversity) and increase policy support for nutrition-sensitive agriculture.

The use of appropriate communication channels will ensure that information reaches women and other marginalized groups. Information will be packaged to suit different audiences. More communication channels will be utilized including media, ICTs, videos, voice messages, women groups, radio, and information centers.

[Ethiopia-specific paragraph on capacity development to go here]

# Project management and coordination

The systematic engagement with development partners in a set of scaling initiatives that is proposed for phase II of the Africa RISING project in the Ethiopian highlands will require some adaption of our management approaches and entities.

## Project staff

Phase II will be managed by a project coordinator working in association with a chief scientist. They will be supported by an M&E expert (appointed by IFPRI in consultation with ILRI), four–eight project facilitators at zonal level, assistant project facilitators as required and a communications/ knowledge management specialist. Further, possibly part-time, inputs will be sought from an IP specialist, capacity development expert and gender, nutrition and GIS specialists.

## Project advisory group (PAG)

This new body—based on the Project Steering Committee format described in the umbrella proposal but with responsibilities tailored to the needs of the project in the Ethiopian highlands—will support the project management team in prioritizing the research conducted through peer review. It will also facilitate interactions at the national and regional levels. The group will be composed of:

* Africa RISING Project Coordinator
* Africa RISING Chief Scientist
* EIAR Representative (Federal)
* Regional MoA representatives (x four)
* Development Partner Representatives (x two rotating)
* CGIAR Representatives (x two rotating)
* USAID Mission Representative

The group will meet at six monthly intervals.

## Partner cross-learning and feedback forum (PCLFF)

It will be constituted to ensure the equitable participation of all Africa RISING local and CGIAR partners in planning and executing the project’s research and development agendas. All project partners will be represented on the PCLFF even during periods when that organization’s staff may not be active in scaling. The PCLFF will also include representation from the communications and M&E teams.

*Wider Engagement*: As the project moves towards scaling and backstopping research, it will rely mainly on the active participation of none research development partners and private sectors. These are partnerships that we need to work very closely even if some of them do not become active immediately. We need a tapered strategy for including the development partners in the scaling process so that they are fully engaged and contributing to the project success. Policymakers from the kebele to the federal level will be engaged to play active role of the scaling initiative.

# Implementation timeline

Our proposed implementation timeline for the first year of the proposed phase II of Africa RISING in the Ethiopian highlands is shown in Table 12. This is based on full implementation of the first group of scaling partnerships during the Meher season of 2017.

Table 12. Implementation Timeline for Africa RISING in the Ethiopian highlands phase II (year one).

|  |  |
| --- | --- |
| Date | Activity |
| October 2016 | Fund allocation received via World Bank PIO. |
| November―December 2016 | Finalize staffing, location of field coordinators and arrangement of facilities. PAG review of scaling partnerships. |
| January―May 2017 | Agree roles and responsibilities and finalise ToRs with development partners. Project inauguration. |
| June―August 2017 | Joint scaling activities with partners (Meher 2017 |
| September―December 2017 | Field days. PAG review of season’s activities. PCLFF convenes. |

# Core CGIAR partners and contact points

The core CGIAR partners and the contact points for each are listed in Table 13.

Table 13. List contacts representing core CGIAR partners in Africa RISING phase II.

|  |  |  |
| --- | --- | --- |
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# Budget

The outline budget for the proposal is shown at Table x [Note: this does not include CKM allocation**—**to be discussed with JG].

Table x. *Outline budget (USD x 1000) for Africa RISING in the Ethiopian highlands phase II (1 October 2016***―***30 September 2021)*.**Error! Not a valid link.**

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| --- | --- | --- | --- | --- | --- | --- |
| Items | 2016―17 | 2017―18 | 2018―19 | 2019―20 | 2020–21 | Total |
| Personnel | 550 | 500 | 450 | 450 | 450 | 2,400 |
| Collaborator costs (CGIAR centers) | 695 | 720 | 795 | 795 | 795 | 3,800 |
| Collaborators costs (others) | 150 | 200 | 200 | 200 | 200 | 950 |
| Supplies and services | 200 | 175 | 150 | 150 | 150 | 825 |
| Operational travel | 80 | 80 | 80 | 80 | 80 | 400 |
| Total direct costs | 1,675 | 1,675 | 1,675 | 1,675 | 1,675 | 8,375 |
| Indirect costs @15% | 251 | 251 | 251 | 251 | 251 | 251 |
| Total | 1,926 | 1,926 | 1,926 | 1,926 | 1,926 | 9,630 |

# CVs of Key Personnel

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| DR PETER THORNE  International Livestock Research Institute  PO Box 5689, Addis Ababa, Ethiopia  Tel: +251 11 617 2000; e-mail: [peter.thorne@cgiar.org](mailto:peter.thorne@cgiar.org)  Role in Africa RISING phase II: Project Coordinator | |
| Nationality | British |
| Profile | Thirty years’ experience in research and research management around livestock intensification and the roles of livestock in mixed farming systems. Specific research interests in systems simulation modelling, crop-livestock interactions (synergies and trade-offs) and farming systems evolution for sustainable intensification. Extensive project management experience in both research and service delivery. Recently appointed to the advisory board of the USAID Sustainable Intensification Innovation Laboratory (Kansas State University). |
| Highest Qualifications | 1986 Ph.D. Animal Nutrition. Nottingham University, UK.  1982 BA. Agriculture and Forest Sciences. Oxford University. UK. |
| Recent Positions held | 11 / 2011 – date: **International Livestock Research Institute** (ILRI) – Principal Scientist and Project Manager, Africa RISING (Research in Sustainable Intensification for the Next Generation.  01 / 2010 – 11 / 2011: **Agriculture and Horticulture Development Board** (AHDB), UK – Head of Production Economics.  06 / 1998 – 01 /2010: **Stirling Thorne Associates**, UK. Partner. Research and consultancy services. |
| Relevant and recent Publications | **Thorne, P.J.** 2015 [The Mess of Measuring Sustainability in Mixed Crop-Livestock Systems](https://scholar.google.co.uk/scholar?oi=bibs&cluster=3173805869739534566&btnI=1&hl=en). Keynote paper presented at the AAAS Annual Meeting, 12-16 February 2015, San Jose, CA.  Duncan, A.J., Tarawali, S.A., **Thorne, P.J.**, Valbuena, D., Descheemaeker, K. and Homann-Kee Tui, S. 2013. Integrated crop-livestock systems− a key to sustainable intensification. *Tropical Grasslands - Forrajes Tropicales*, 1 (2): 202 – 206.  Janssen, S., Louhichi, K., Kanellopoulos, A., Zander, P., Flichman, G., Hengsdijk, H., Meuter, E., Andersen, E., Belhouchette, H., Blanco, M., Borkowski, N., Heckelei, T., Hecker, M., Li, H., Oude Lansink, A., Stokstad, G., **Thorne, P.**, van Keulen, H. and van Ittersum, M.K. (2010) A Generic Bio-Economic Farm Model for Environmental and Economic Assessment of Agricultural Systems. *Environmental Management*, 46 (6): 862―877.  Thornton, P.K., Kristjanson, P.M. and **Thorne, P.J.** 2003. [Measuring the potential impacts of improved food-feed crops: methods for ex ante assessment](http://www.sciencedirect.com/science/article/pii/S0378429003001515). *Field Crops Research*, 84 (1): 199-212  **Thorne, P.J.** and Tanner, J.C. 2002. [Livestock and nutrient cycling in crop–animal systems in Asia](http://www.sciencedirect.com/science/article/pii/S0308521X01000397). *Agricultural Systems*, 71 (1): 111―126. |

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| DR KINDU MEKONNEN  International Livestock Research Institute  PO Box 5689, Addis Ababa, Ethiopia  Tel: +251 911469056; e-mail: k.mekonnen@cgiar.org  Role in Africa RISING phase II: Chief Scientist | |
| Nationality | Ethiopian |
| Profile | Over 25 years of research and R4D experiences in public and private organizations including: Ethiopian Institute of Agricultural Research (EIAR) and International Livestock Research Institute (ILRI-). In these years I have acquired a sound knowledge of:   * Research on agricultural production system components interaction (crop, livestock, and trees) and integration; * Production system analysis at farm, landscape and watershed levels and tradeoffs; * Research for integrated watershed management and agroforestry systems; * Analyzing smallholders livelihood and climate change adaptation strategies and their adoption of improved natural resources management interventions; * Leading and managing human and financial resources, planning and organizing project implementation; establishing and managing partnership and working in multi-disciplinary and multi-cultural teams; conceptual thinking and agenda development. |
| Highest Qualifications | Mar 2004―July 2007- PhD in Natural Resources Management at the Institute of Forest Ecology, University of Natural Resources and Applied Life Sciences, Vienna, Austria.  Oct 1993―June 1996- Master of Philosophy (MPhil) in Forestry/Agroforestry at Moi University, Kenya.  Sept 1984―July 1988- Bachelor of Science (BSc) in Plant Sciences at Alemaya University of Agriculture, Ethiopia. |
| Recent Positions held | August 2014―present: Crop-Livestock Systems scientist at ILRI  March 2010―August 2014: Visiting Scientist at ILRI  2008―March 2010: EIAR–IWM (Integrated Watershed Management) case team leader and AHI (African Highlands Initiative) project site coordinator  2001―2004: EIAR―AHI site coordinator |
| Relevant and recent Publications | Valbuena, D., Homann-Kee Tui, S., Erenstein, O., Teufel, N., Duncan, A.J., Abdoulaye, T., Swain, B., **Mekonnen, K.**, Germaine, I. and Gérard, B. 2015. Identifying determinants, pressures and trade-offs of crop residue use in mixed smallholder farms in Sub-Saharan Africa and South Asia. *Agricultural Systems*, 134: 107–118.  **Mekonnen, K.,** Alan, D.J., Valbuena, D., Gerard, B., Dagnachew, L., Mesfin B., and Gedion, J. 2014. Intensification of crop-livestock farming systems in east Africa: A comparison of selected sites in the highlands of Ethiopia and Kenya: *In*: Bernard Vanlauwe et al. (eds): Challenges and Opportunities for Agricultural Intensification of the Humid highland systems of Sub-Saharan Africa. Springer International Publishing Switzerland.  Duncan, A.J., Teufel, N., **Mekonnen, K.**, Singh, V.K., Bitew, A. and Gebremedhin, B. 2013. Dairy intensification in developing countries: effects of market quality on farm-level feeding and breeding practices. *Animal*: 7 (12): 2054–2062.  **Mekonnen, K.**, Glatzel, G. and Sieghardt, M. 2011. Hagenia abyssinica (Bruce) J.F. Gmel: A preferred tree for fodder and soil fertility improvement at Galessa watershed, central Ethiopia. *Ethiopian Journal of Natural Resources,* 11 (2): 277–291.  **Mekonnen, K.**, Glatzel, G., Sieghardt, M., Kidane, B. and Bekele, T. 2008. Chemical composition of the green biomass of indigenous tree and shrub species in the highlands of Central Ethiopia: Implications for soil fertility management. *Journal of Tropical Forest Science*, 20(3): 167–174.  **Mekonnen, K.**, Yohannes, T., Glatzel, G. and Amha, Y. 2006. Performance of eight tree species in the highland Vertisols of Central Ethiopia: growth, foliage nutrient concentration and effect on soil chemical properties. *New Forests*, 32: 285–298. |

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1. CIAT, CIMMYT, CIP, ICARDA, ICRAF, ICRISAT, ILRI, IWMI [↑](#footnote-ref-1)